

ATMOSPHERIC ELECTRICITY.

Thunder Storms.—Comparatively few have been reported during the month and mostly from the northern sections of the country. The most extensive, as well as severe, was that of the 15th and 16th. Distributed among the several States, they were reported on the following dates:—*Maine*: 23rd. *Massachusetts*: 12th, 23rd, 25th, 30th and 31st. *New York*: 3rd, 12th and 16th. *Virginia*: 15th, 22nd and 30th. *North Carolina*: 22nd. *Florida*: 3rd, 5th, 7th and 28th. *Tennessee*: 3rd, 14th, 15th, 16th and 26th. *Kentucky*: 14th and 15th. *Ohio*: 1st, 2nd, 14th, 15th, 17th and 21st. *Indiana*: 1st and 15th. *Illinois*: 1st, 2nd, 3rd, 14th, 15th, 21st, 24th and 25th. *Michigan*: 1st, 2nd, 3rd, 4th, 15th and 25th. *Wisconsin*: 10th and 16th. *Iowa*: 1st, 2nd, 3rd, 10th, 11th, 13th, 15th and 24th. *Missouri*: 15th and 25th. *Mississippi*: 27th. *Louisiana*: 3rd, 27th and 28th. *Texas*: 2nd, 3rd, 13th, 15th, 16th, 21st, 26th and 27th. *Indian Territory*: 13th, 15th and 25th. *Kansas*: 2nd and 20th. *Nebraska*: 2nd, 3rd and 13th. *Colorado*: 26th. *New Mexico*: 24th.

Auroras.—The most extensive occurred on the evenings of the 7th, 28th and 30th, and the early morning of the 31st, and were reported by various observers, both Signal Service and Voluntary, from stations reaching eastward from Dakota to Maine, and southward to the 37th parallel. That of the 30th, although very probably present in the Lower Lake region, Tennessee and the Ohio valley, was not visible on account of cloudy and threatening weather. The most frequent and profuse displays were observed in the New England States, followed next in order by Michigan and Minnesota. A detailed description from stations arranged by States will give data of additional interest, as follows: *Maine*: Portland, 28th, 1:15 to 1:45 a. m., no motion; 31st, 11:15 to 11:40 p. m. Eastport, 7th, 9 p. m. Bangor, 29th, 1:00 to 3:00 a. m. Cornish, 7th, 25th, 28th, faint. Gardiner, 6th, 8th, 25th, 27th, 31st, faint. Orono, 1st. *New Hampshire*: Mt. Washington, 7th, 11 p. m., till morning; 25th, 9 p. m., till morning; 27th, 9 p. m., till morning. Grafton, 25th, 8:00 to 11:00 p. m., parallel and horizontal bands of dark blue and white. *Vermont*: Burlington, 1st, midnight to 12:30 a. m.; 4th, 9:00 p. m., to 12:15 a. m.; 7th, 10:00 p. m., to 12:15 a. m.; 25th, 6:40 to 8:30 p. m.; 11:15 p. m., to midnight. Windsor, 7th, 9:00 p. m. Newport, 7th, 25th, 28th. Woodstock, 31st, early morning. *Massachusetts*: Wood's Holl, 31st, 11:00 p. m. Springfield, 31st, 11:18 to 11:35 p. m. Cambridge, 7th, 9:00 to 12:00 p. m.; 12th, 10:30 p. m.; 23rd, 7:30 to 9:00 p. m.; 25th, 9:00 to 11:30 p. m. Fall River, 7th, 9:00 p. m., faint; 24th, 9:00 to 11 p. m.; 25th, vertical at 9:00 p. m.; scintillations very bright; streamers from the southwest; a very unusual occurrence here. Newburyport, 7th, 25th, 31st, all very faint, no streamers and variable till midnight. Rowe, 7th, 11:00 p. m. Somerset, 23d, 28th, diffuse yellow light. *Connecticut*: Southington, 23d, 9:00 p. m.; 25th; 31st, 11:00 p. m. New London, 25th, 9:10 to 10:20 p. m. *Rhode Island*: Newport, 7th, 11:00 to 11:30 p. m.; 23d, 8 to 9:30 p. m. *New York*: Ardenia, 14th, 9:00 p. m. Argyle, 7th, 7 to 9 p. m., diffuse; 25th, 7 to 9 p. m. Rochester, 8:55 to 10:45 p. m. *Virginia*: Wytheville, 31st, tinged with red. *Michigan*: Lansing, 31st, 1:30 a. m. Litchfield, 1st, 6th, 9th, 22d, all visible at 9:00 p. m. Port Huron, 28th, 1:10 to 2:20 a. m., color pale green, with faint streamers. *Wisconsin*: Manitowoc, 7th, 8:30 to 10:00 p. m., streamers. Ripon, 7th, 9:00 p. m., faint above a dark cloud. Milwaukee, 31st, 1 a. m., merry dancers. *Illinois*: Springfield, 9th, 10:00 p. m. Sterling, 31st, early morning. *Iowa*: Cresco, 31st, early morning, very faint. Ft. Madison, 30th, faint. Monticello, 30th, 11 p. m. Independence, 7th. *Minnesota*: St. Vincent, 1st, 8 p. m.; 7th; 9th, 4 a. m.; 23d, 9 p. m. St. Paul, 30th, 9 to 11 p. m. *Dakota*: Bismarck, 30th, 9 p. m. to midnight. Yankton, 31st, 2 a. m., faint arch. *Nebraska*: Clear Creek, 28th, p. m., faint.

Atmospheric Electricity Interfering with Telegraph Lines.—Umatilla, Or., 13th and 25th. El Paso, Tex., 23rd. Socorro, N. M., 2nd, 11th, 12th and 24th. Pilot Point, Tex., 2nd, 21st and 26th. Decatur, Tex., 26th. Jacksboro, Tex., 2nd and 21st. San Antonio, Tex., 27th. Fort Davis, Tex., 2nd. Stockton, Tex., 14th.

Zodiacal Light.—St. Vincent, Minn., 1st. Nashville, Tenn., 2nd, 6th to 14th and 31st. Fall River, Mass., 2nd and 3rd. Somerset, Mass., 1st and 2nd.

MISCELLANEOUS PHENOMENA.

Butterflies.—San Antonio, Tex., 16th, 17th. Melissa, Tex., 21st.

Grasshoppers.—Coleman City, Tex., 28th, flying south in great numbers.

Meteors.—Sterling, Ill., 31st. Woodstock, Md., 5th, 21st. Williamstown, Mass., 21st, 28th. Ateo, N. J., 3rd, 25th. Penn Yan, N. Y., 5th. Bethel, Ohio, 13th; Wytheville, Va., 2nd.

Prairie and Forest Fires.—St. Vincent, Minn., 7th, 23rd, 24th. LaCrosse, 27th, 30th, 31st. Breckenridge, 1st, 2nd, 4th to 12th, 26th, 31st. Freehold, N. J., 13th. Wytheville, Va., 21st, 23rd to 26th, 29th.

Botanical.—Flushing, N. Y., 31st, wild flowers blooming. Elsworth, N. C., 21st, peach trees in bloom second time. Melissa, Tex., 22nd, roses in full bloom; potatoe vines still growing; 31st, cotton still blooming.

Polar Bands.—Portland, Or., 9th, 12th. Cleveland, 7th. Morgantown, 17th. New Haven, 17th.

Sterling, Ill., 31st. Gardiner, Me., 1st, 20th. Freehold, N. J., 16th, 17th, 26th. Cleburne, Tex., 1st to 8th. Woodstock, Vt., 22nd. Wytheville, Va., 4th, 19th, 20th, 21st, 31st.

Sunsets.—The characteristics of the sky at sunset as indicative of fair or foul weather for the succeeding twenty-four hours have been observed at all Signal Service Stations. Reports from 134 stations show 4,116 observations to have been made, of which 19 were reported doubtful; of the remainder, 3,472 or 84.4 per cent. were followed by the expected weather.

Sea-fog Wave.—The recurrence of this phenomenon at New Westminster, B. C., which has been referred to in previous REVIEWS, occurred in 1879 on September 21st. This year it arrived on October 22nd, and Mr. A. Peele, the observer, comments upon it as follows: "On the 22nd we had thick fog until 10:30 a. m., when a small blue patch of sky was seen in the west, and in 15 minutes not a sign of fog existed, except in the south and southwest, where a heavy bank of fog remained until 2 p. m., when it began to move inland rapidly and the *annual sea-fog wave* again struck us, sending down the thermometer as it advanced." On October 26th he writes: "This year, so far, it has changed the whole character of the weather. We had a dry October, but since the wave came we have not had a fine day."

Sun Spots.—The following record of observations, made by Mr. D. P. Todd, Assistant, has been forwarded by Prof. S. Newcomb, U. S. Navy, Superintendent Nautical Almanac Office, Washington, D. C.:

DATE— Oct., 1880.	No. of new—		Disappeared by solar rotation.		Reappeared by solar rotation.		Total number visible.		REMARKS.
	Groups	Spots.	Groups	Spots.	Groups	Spots.	Groups	Spots.	
1st, 7 a. m....	1	5	0	10	0	0	4	55†	Faculae.
3rd, 10 a. m....	1	5	0	10	0	0	4	80†	Faculae.
4th, 4 p. m....	1	2	0	20	1	2	4	20†	Broad areas of faculae.
6th, 8 a. m....	1	2	1	3	0	0	4	12	Faculae.
7th, 9 a. m....	0	0	0	0	0	0	4	12	Faculae.
8th, 8 a. m....	0	0	0	0	0	0	4	12	Faculae.
9th, 9 a. m....	0	0	0	0	0	0	3	12	Faculae.
1 p. m....	0	4	0	0	0	0	3	16	Faculae.
5 p. m....	0	0	0	0	0	0	3	16	Faculae.
10th, 3 p. m....	1	2	0	0	0	0	4	22	Faculae.
11th, 10 a. m....	1	2	0	0	0	0	5	24	Broad areas of faculae: many of the spots small.
12th, 10 a. m....	0	0	1	4	0	0	4	14	Faculae.
15th, 2 p. m....	0	0	1	2	0	0	3	12	
16th, 10 a. m....	0	0	0	2	0	0	3	10	
19th, 1 p. m....	2	10			1	3	3	25†	
21st, 8 a. m....	0	0	0	0	0	0	3	25†	Faculae.
24th, 12 m....	2	13					3	25†	Faculae.
2 p. m....	0	0	0	0	0	0	3	25†	Faculae.
27th, 12 m....	1	5	1	10	0	0	3	20†	Faculae.

†Approximated.

Mr. William Dawson, at Spiceland, Ind., reports: 1st, 4 groups, 108 spots; 2nd, 4 groups, 75 spots, new group at E. edge; 5th, 5 groups, 8 spots, new group E. edge; 6th, 4 groups, 20 spots, faculae at W. edge; 7th, 4 groups, 16 spots, faculae at E. edge; 8th, 3 groups, 16 spots; 9th, 3 groups, 33 spots; 12th, 3 groups, 10 spots, new group and much faculae at E. edge; 13th, 3 groups, 13 spots; 20th, 4 groups, 50 spots; 21st, 3 groups, 55 spots; 29th, 4 groups, 18 spots; 31st, 3 groups, 12 spots.

Mr. David Trowbridge, Waterbury, N. Y., reports: 1st, same groups as on September 30th, 11 spots; 2nd, same groups, 4 spots; 3rd, 2 groups in W., 5 spots, faint group in E.; 4th, same; 5th, 2 groups, 2 spots; 6th, same; 7th, E. group, 1 spot, and new group in the NE. quadrant; 8th, 1 spot in the W. group and 3 in the NE. group; 9th, same groups still visible, with 5 spots; 10th and 11th, same groups, with 7 spots; 12th, groups of yesterday have disappeared by solar rotation, new spot near E. limit; 13th, 1 spot visible in the NE. quadrant; 14th, same still visible and a new group appearing by rotation in the NE. quadrant; 15th and 18th, same, 2 spots; 20th, 3 groups, 8 spots; the two old groups have changed so that the W. group has 4 spots and the E. group 2; new group, 2 spots in SE. quadrant; 21st, same; 25th, 2 groups, the new one in the NE. quadrant having 3 spots; 28th, 2 groups; 31st, 1 group of faint spots in SE. quadrant; 16th, 17th, 19th, 22nd, 23rd, 24th, 26th, 27th, 29th and 30th, cloudy.

Mr. H. D. Govey, at North Lewisburg, O., reports that he observed spots every day during the month, but gives particulars of the largest spots only, as follows: October 1st, 6:05 a. m. (Washington mean time) 2 groups, the one containing one large and five smaller spots in the NE. quadrant, the other containing one large and seven smaller spots in NW. quadrant; 5th, 12:05 p. m., two large spots, one in the NE. quadrant near edge and the other in the centre of the SW. quadrant; 10th, 7:20 a. m., 2 groups, one of three spots in the NE. quadrant, the other of five spots in the SW. quadrant; 16th, 12:50 p. m. two spots in the W. just N. of equator, one quite large the other much smaller; 21st, 1:20 p. m., 3 groups, one of two large and three small spots in the NE. quadrant, the second of three large spots north of the centre and the third of one large and three small spots in the SW. quadrant; 31st, 7:35 a. m., 2 groups of two spots each, one in the NW. quadrant the other in the SE. quadrant; large spots were more numerous on the 21st than on any other day.